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Pascal Daguiar

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EXAMINER

SHEVIN, MARK L

ART UNIT

PAPER NUMBER

1793

NOTIFICATION DATE

DELIVERY MODE

04/13/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/593,463	Applicant(s) DAGUIER ET AL.	
	Examiner MARK L. SHEVIN	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Claims 1-4, filed June 4th, 2009 are pending.

Acknowledgement of RCE

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 11th, 2010 has been entered.

Status of Previous Rejections

3. The previous rejections of claims 1-4 under 35 U.S.C 103(a) over **Badard** (WO 03/012156 – English Machine Translation and PCT Written Opinion) are maintained and now rely on the full (human) English translation, which has been attached to the instant Office action.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

4. **Claims 1-4** rejected under 35 U.S.C. 103(a) as being unpatentable over **Badard** (WO 03/012156 A1 – Full English Translation).

Badard:

Badard is drawn to a method for making a steel mechanical component of a composition as shown in the table below (Abstract and claims 1-5; p. 2, line 11 – p. 3, line 11).

Elements	Claim 1	Badard	Overlap
C	0.19 – 0.25	0.12 – 0.3	0.19 – 0.25
Mn	1.1 – 1.5	1 – 1.6	1.1 – 1.5
Si	0.8 – 1.2	0.8 – 1.5	0.8 – 1.2
S	0.01 – 0.09	0 – 0.1	0.01 – 0.09
P	trace – 0.025	0 – 0.03	trace – 0.025
Ni	trace – 0.25	0 – 0.6	trace – 0.25
Cr	1 – 1.4	0.4 – 1.6	1 - 1.4
Mo	0.10 – 0.25	0 – 0.3	0.10 – 0.25
Cu	trace – 0.3	0 – 0.3	trace – 0.3
Al	0.01 – 0.045	0 – 0.06 (0.008 – 0.05)	0.01 – 0.045
Nb	0.01 – 0.045	0 – 0.05 (0.02 – 0.05)	0.01 – 0.045
N	0.013 – 0.03	0.007 – 0.025	0.013 – 0.025
Bi	opt trace – 0.1	0 – 0.08	trace – 0.08
Pb	opt trace – 0.12	0 – 0.07	trace – 0.07
Te	opt trace – 0.015	0 – 0.02	trace – 0.015
Se	opt trace – 0.03	0 – 0.04	trace – 0.03
Ca	opt trace - 0.0050	0 – 0.05	trace – 0.0050
Fe	Balance	Balance	Balance
Carburizing – Carbo-nitriding	950 – 1050 °C	950 – 1050 °C	950 – 1050 °C

Elements	Claim 3	Badard	Overlap
C	0.19 – 0.25	0.12 – 0.3	0.19 – 0.25
Mn	1.2 – 1.5	1 – 1.6	1.2 – 1.5
Si	0.85 – 1.2	0.8 – 1.5	0.85 – 1.2
S	0.01 – 0.09	0 – 0.1	0.01 – 0.09
P	trace – 0.025	0 – 0.03	trace – 0.025
Ni	0.08 – 0.25	0 – 0.6	0.08 – 0.25
Cr	1.1 – 1.4	0.4 – 1.6	1.1 - 1.4
Mo	0.10 – 0.25	0 – 0.3	0.10 – 0.25
Cu	0.06 – 0.3	0 – 0.3	0.06 – 0.3

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Al	0.01 – 0.045	0 – 0.06 (0.008 – 0.05)	0.01 – 0.045
Nb	0.015 – 0.045	0 – 0.05 (0.02 – 0.05)	0.015 – 0.045
N	0.013 – 0.03	0.007 – 0.025	0.013 – 0.025
Bi	opt trace – 0.07	0 – 0.08	trace – 0.07
Pb	opt trace – 0.12	0 – 0.07	trace – 0.07
Te	opt trace – 0.010	0 – 0.02	trace – 0.010
Se	opt trace – 0.020	0 – 0.04	trace – 0.020
Ca	opt trace - 0.045	0 – 0.05	trace – 0.045
Fe	Balance	Balance	Balance
Carburizing Carbo-nitriding –	950 – 1050 °C	950 – 1050 °C	950 – 1050 °C

Elements	Claim 4	Badard	Overlap
C	0.20 – 0.25	0.12 – 0.3	0.20 – 0.25
Mn	1.21 – 1.46	1 – 1.6	1.21 – 1.45
Si	0.85 – 1.10	0.8 – 1.5	0.85 – 1.10
S	0.01 – 0.08	0 – 0.1	0.01 – 0.08
P	trace – 0.020	0 – 0.03	trace – 0.020
Ni	0.08 – 0.20	0 – 0.6	0.08 – 0.20
Cr	1.10 – 1.40	0.4 – 1.6	1.10 – 1.40
Mo	0.11 – 0.25	0 – 0.3	0.11 – 0.25
Cu	0.08 – 0.3	0 – 0.3	0.08 – 0.3
Al	0.01 – 0.035	0 – 0.06 (0.008 – 0.05)	0.01 – 0.035
Nb	0.025 – 0.040	0 – 0.05 (0.02 – 0.05)	0.025 – 0.040
N	0.013 – 0.022	0.007 – 0.025	0.013 – 0.022
Bi	opt trace – 0.07	0 – 0.08	trace – 0.07
Pb	opt trace – 0.12	0 – 0.07	trace – 0.07
Te	opt trace – 0.010	0 – 0.02	trace – 0.010
Se	opt trace – 0.020	0 – 0.04	trace – 0.020
Ca	opt trace - 0.045	0 – 0.05	trace – 0.045
Fe	Balance	Balance	Balance
Carburizing Carbo-nitriding –	950 – 1050 °C	950 – 1050 °C	950 – 1050 °C

Al content is preferably from 0.008 – 0.05% so that the grains do not grow too large, in conjunction with preferred Nb and N contents (p. 6, para 3).

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Adding Nb allows a more homogenous grain size to be obtained, which promotes homogeneity of plastic deformation in use and further minimizes this deformation (p. 6, lines 24-31).

A relatively high nitrogen content, from 70-250 ppm is recommended if carburizing or carbonitriding is carried out at elevated temperature (p. 7, lines 15-22).

Badard also describes a mechanical part obtained using this method, which is a pinion component.

Regarding claims 1-4, it would have been obvious to one of ordinary skill in steel metallurgy, at the time of the invention, to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980). MPEP 2144.05, para I states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists." Badard discloses a steel with overlapping ranges of C, Mn, Si, S, P, Ni, Cr, Mo, Cu, Al, Nb, N, Bi, Pb, Te, Se, Ca, and Fe along with a substantially identical processing method as explained above.

With respect to the Jominy test criteria specified in the claims, if the starting point is substantially identical composition which is subjected to substantially identical heat and thermomechanical treatments, then one of ordinary skill would reasonably expect identical structures and properties to be obtained and thus the average values of the five Jominy tests will thus necessarily be at the intervals claimed in claims 1 and 2.

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From MPEP 2112, V: "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on 'inherency' under 35 U.S.C. 102, on 'prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. *In re Fitzgerald*, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

Affidavit under 37 CFR 1.132

5. The affidavit under 37 CFR 1.132 filed February 12th, is insufficient to overcome the rejection of claims 1-4 based upon Badard (WO 03/012156) as set forth in the Office action mailed September 11th, 2009 for the following reasons:

The affidavit corrects the errors in the drawing (drawing filed September 19th, 2006) of the application.

The affidavit states that "it appears clearly that the Jominy curves of the steels of the invention (top three curves with marked vertical bars, closed circles, and "x"s) are flattest than those of the reference steels, deprived of any inflexion point.

In response, the Examiner disagrees with the statement that the inventive alloys are "deprived of any inflexion point". This is not supported Applicants' own replacement drawing filed February 12th, 2010. Curve G ("x"s - inventive alloy) has an inflection point at ~11 mm; Curve F (vertical bars – inventive alloy) has one at ~10 mm and curve E

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(closed circles – inventive alloy) at ~11 mm. Applicants have not explained how the differences in Jominy curves of Fig. 1 are of practical importance, and if that, how are these statistically significant and commensurate in scope with the instant claims.

The affidavit further includes an additional figure comparing the residual deformation of inventive steel E to comparative steel A as a function of μm (micrometers), stating that "the influence of the Jominy curve is real and measurable" and that "the steel of invention E allows to obtain, after heat treatment, a residual deformation less pronounced and less scattered than the reference steel A when heat treated in the same conditions.

In response, MPEP 716.02(d), para 1 states: "Whether the unexpected results are the result of unexpectedly improved results or a property not taught by the prior art, the "objective evidence of nonobviousness must be commensurate in scope with the claims which the evidence is offered to support." In other words, the showing of unexpected results must be reviewed to see if the results occur over the entire claimed range."

In this case, Applicants only demonstrate improved residual deformation of a single example of the inventive steel as compared to a single example of a comparative steel. There is no indication that the inventive steel will attain these favorable results over the entire composition ranges of instant claim 1 based on the showing of a single inventive example. Furthermore "to establish unexpected results over a claimed range, applicants should compare a sufficient number of tests both inside and outside the claimed range to show the criticality of the claimed range (MPEP 716.02(d), section II),

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and a single comparative example is not a sufficient number of tests outside the claimed ranges, just as a single example within the claimed ranges is not sufficient to demonstrate nonobviousness of the claimed ranges.

In view of the foregoing, when all of the evidence is considered, the totality of the rebuttal evidence of nonobviousness fails to outweigh the evidence of obviousness.

Response to Applicant's Arguments:

6. Applicant's arguments filed June 9th, 2009 have been fully considered but they are not persuasive.

Applicants assert (pages 4-5) that the combination of the influences of various elements present in the steel cause a desired shape to be produced in the Jominy curves and that "the claimed ranges of the elements recited in claim 1 are critical to producing a composition of steel which produce a Jominy curve with no inflection point...".

Applicants further assert *(p. 7) that even if the invention steels have inflection points in their Jominy curves, these inflection points are not "significantly marked inflection points".

In response, the Examiner considers curves E, F, and G (closed circles, vertical bars, and "x"s - all three inventive steels examples) to have inflection points and thus it is not clear what the patentable distinction is between the inventive steels and the comparative steels. Even if the invention steels have less of a degree of inflection, it is

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not clear how this distinguishes the inventive steels over the comparative examples or why these results are both practically and statistically significant.

Furthermore, even if one were to concede that certain inventive steels have clearly distinct advantages in terms of lack of inflection point, greater hardness, etc, the nature of the inventive and comparative examples lack sufficient data to show such advantages among compositions comparable in scope to the instant claims.

Looking at the composition table on p. 13 of the instant specification, in all cases when the reference (comparative) steels had alloying elements outside of the ranges of instant claim 1, they were always lower. Mn in ref A is low, Si in Refs A and B is low, Cr is Refs C and D is low, Mo is Refs A, B, and C is low, Nb is Ref A is low, and N in ref D is low. The issue is that “to establish unexpected results over a claimed range, applicants should compare a sufficient number of tests both inside and outside the claimed range to show the criticality of the claimed range (MPEP 716.02(d), section II). In this case, to demonstrate that the purported unexpected results occur over the entire range of claim 1, comparative examples having alloying elements present in amounts greater than claimed are needed to establish that the unexpected results apply up to the upper limits of the claimed ranges of instant claim 1. It is insufficient to simply show results of comparative examples with ranges lower than those claimed.

Conclusion

-- Claims 1-4 are rejected
-- No claims are allowed

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The rejections above rely on the references for all the teachings expressed in the texts of the references and/or one of ordinary skill in the metallurgical art would have reasonably understood or implied from the texts of the references. To emphasize certain aspects of the prior art, only specific portions of the texts have been pointed out. Each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

All recited limitations in the instant claims have been met by the rejections as set forth above. Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. § 1.121; 37 C.F.R. Part §41.37 (c)(1)(v); MPEP §714.02; and MPEP §2411.01(B).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Shevin whose telephone number is (571) 270-3588 and fax number is (571) 270-4588. The examiner can normally be reached on Monday - Friday, 8:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy M. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Mark L. Shevin/
Examiner, Art Unit 1793

April 5th, 2010
10-593,463

/George Wyszomierski/
Primary Examiner
Art Unit 1793